"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

The Dispersion of the Divisors and Quadratic Forms in Arithmetic Series and Some Binary Additive Problems 20-120-5-8/67

$$\sigma(n,D) = \prod_{p/D} \left(1 - \frac{X_d(p)}{p}\right) \times \prod_{p/d_{11}} \left(1 + X_d(p) + \ldots + X_d^{a_p}(p)\right) \times$$

$$\times \prod_{p/d_{11}} \left(1 + X_d(p) + \ldots + X_d^{a_p-1} + \frac{X_d^{a_p}(p)}{1 + X_d(p)/p}\right),$$

where p^{a_p}/d_{11} & $p^{a_p+1} \nmid d_{11}$.

For some binary additive problems such formulas can be used for $D \leq n^{1-\eta_0}$ ($\eta_0 > 0$ small). These formulas are not known. But for the solution of the mentioned problems only formulas for "almost all" D are necessary. That causes the author to consider the "dispersion" of the number of divisors and the values $\sigma(n,v)$ in the arithmetic series. Thus he obtains the following formulas for the case $n^{1/2} < D_1 < n^{1-\eta_1}$, $D_1 < D_2 < D_1^{1+\eta_2}$, $1 < n$, $\eta_1, \eta_2 > 0$ small:

(1) $\sum_{(D_1,D_2)=1} \left(\sum_{m \equiv \ell \pmod{D}} \right) \ll \ldots$

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The Dispersion of the Divisors and Quadratic Forms in Arithmetic [illegible] of Series and Some Binary Additive Problems

$$(1)\qquad \sum_{D_1 \le D \le D_1+D_2} \Bigg(\sum_{\substack{Q \equiv n \pmod D \\ Q \le n}} 1 - \frac{2\pi n}{\sqrt{|d|}\, D} \sigma(n,D) \Bigg)^2 = O\left(\frac{n^{2-\eta_5}}{D_1^2} D_2 \right).$$

These formulas give the "dispersion" of the considered terms in series. With the aid of an analogue of the Chebyshev inequation there follows that (1) and (2) are valid for "almost all" D between D_1 and D_1+D_2. The number of not admitted D is $O(D_1^{1-\eta_4})$.

In the solution of the binary problems the influence of the excluded D is considered by an estimation from above.

In this way the following results can be obtained:

Theorem: For $l = 1$, $k \geq 2$, $n \to \infty$ holds

$$\sum_{m \le n} c_2(m)\, c_k(m+l) \sim k!\, C_{k-1} S_k n (\ln n)^k,$$

where $S_k = \sum_{n=1}^{\infty} \mu(n) n^{-2} \times \prod_{p/n} \left(p\left(1-\left(1-\frac{1}{p}\right)^{k-1}\right)\right)$;

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The Dispersion of the Divisors and Quadratic Forms in Arithmetic Series and Some Binary Additive Problems 20-120-5-8/57

$$\sigma_{k-1} = \lim_{Y \to \infty} (\ln Y)^{-k+1} \int \cdots \int (y_1 \cdots y_{k-1})^{-1} dy_1 \cdots dy_{k-1}$$

$$1 \leq y_1 \leq \cdots \leq y_{k-1} \leq Y(y_1, \ldots, y_{k-1})^{-1}$$

[illegible]

1. [illegible]

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

16(1)

SOV/20-123-6-5/50

AUTHOR: Linnik, Yu.V. (Corresponding Member of the AS USSR)

TITLE: The Solution of Some Binary Additive Problems by Counting the Dispersion in Progressions (Resheniye nekotorykh binarnykh additivnykh zadach podschetom dispersii v progressiyakh)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 6, pp 975-977 (USSR)

ABSTRACT: The solution methods for binary problems basing on the notion of the dispersion of quadratic forms have been proposed by the author [Ref 1] and are continued in the present paper: Let $\alpha > 0$ be sufficiently small; $N_1 = n^{1-\alpha}$, $N_2 = n^{\alpha}$; let p_1 run through the prime numbers $\leq N_1$; let p_2 run through the prime numbers $\leq N_2$; let $\xi^2 + \eta^2$ run through numbers free of squares. Then for the number $H(n)$ of solutions of $n = p_1 p_2 + \xi^2 + \eta^2$ it holds

[illegible]

There are 2 references, 1 of which is Soviet, and 1 English.

ASSOCIATION: Leningradskoye otdeleniye matematicheskogo instituta imeni V.A. Steklova Akademii nauk SSSR (Leningrad Section of the Mathematical Institute imeni V.A. Steklov, AS USSR)

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SUBMITTED: September 13, 1958

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu. V.

16(0) P.4 PHASE I BOOK EXPLOITATION SOV/3177

Matematika v SSSR za sorok let, 1917-1957. tom 1: Obzornyye stat'i (Mathematics in the USSR for Forty Years, 1917-1957). Vol 1: Review Articles) Moscow, Fizmatgiz, 1959. 1002 p. 5,500 copies printed.

Eds: A. G. Kurosh, (Chief Ed.), V. I. Bityutskov, V. G. Boltyanskiy, Ye. B. Dynkin, O. Yu. Shilova, and A. P. Yushkevich; Ed. (Initials illegible) A. P. Kapitonova; Tech. Ed. (Initials illegible) Ye. A. Abramova.

(Mathematics in the USSR for 40 Years). The book is divided into the major divisions of the field, i.e., algebra, topology, theory of probabilities, functional analysis, etc., and contributions and outstanding problems in each discussed. A listing of some 1400 Soviet mathematicians is included with references to their contributions in the field.

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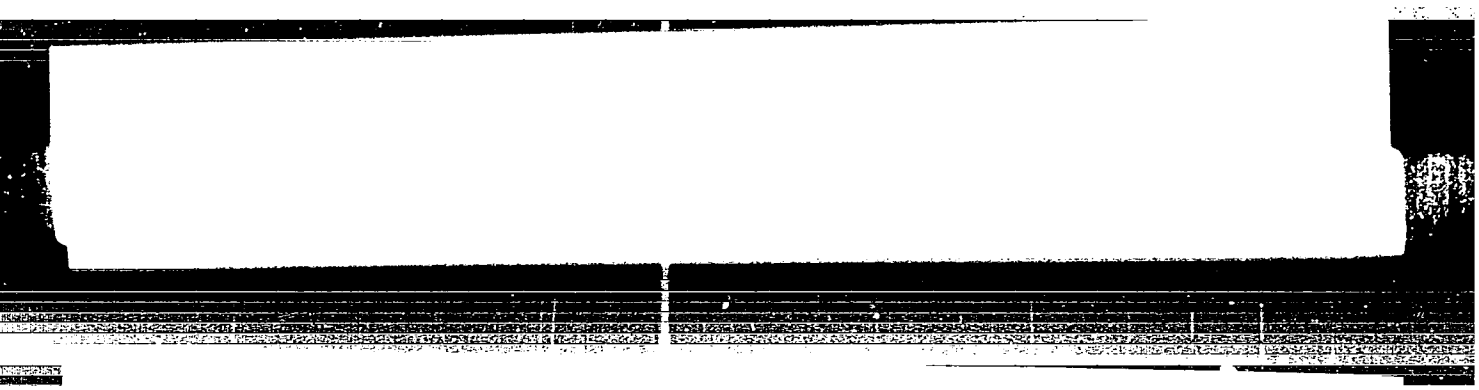

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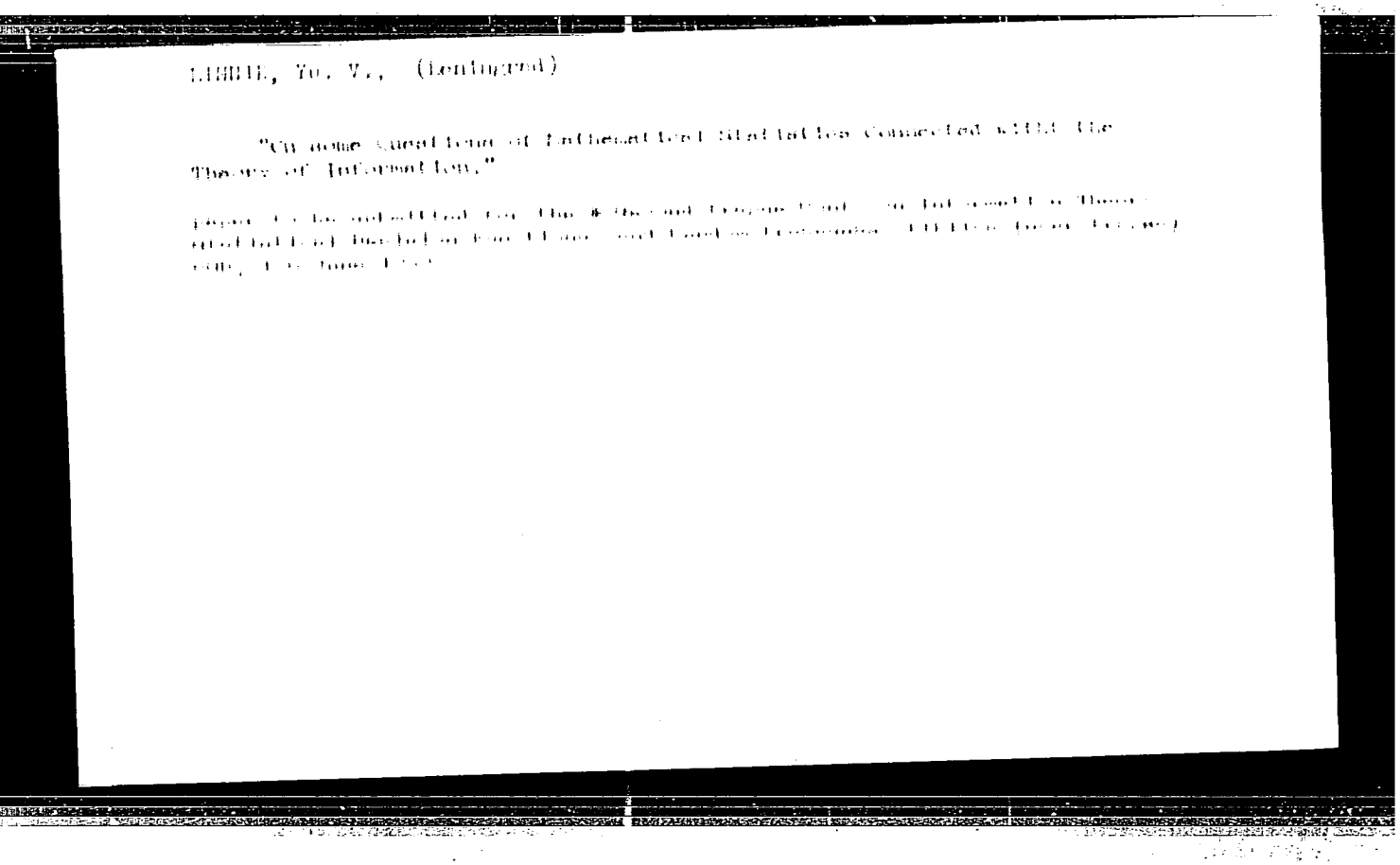

LIBBIE, Yu. V., (Dentigrad)

"On some questions of mathematical statistics connected with the Theory of Information."

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

SOV/43-59-1-2/17

16(1)

AUTHOR: Linnik, Yu.V.

TITLE: On the "α- Factorization" of the Infinitely Divisible Laws of Probability (Ob "α- razlozheniyakh" bezgranichno delimykh veroyatnostnykh zakonov)

PERIODICAL: Vestnik Leningradskogo universiteta, Seriya matematiki, mekhaniki i astronomii, 1959, Nr 1(1), pp 14-23 (USSR)

ABSTRACT: In the present paper the author continues the investigations of the infinitely divisible laws of probability (see author [Ref 1-4]). He uses the same denotations.
Theorem: Assume that for a sequence of real values $t_k \to 0$ it holds

(1) $$(f_1(t_k))^{\alpha_1} \cdot \ldots \cdot (f_n(t_k))^{\alpha_n} = \varphi(t_k),$$

where $\alpha_j > 0$ $(j=1,2,\ldots,n)$; $f_j(t)$ the characteristic function of random variables, $\varphi(t)$ the characteristic function of an infinitely divisible law of the type

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

On the "α - Factorization" of the Infinitely Divisible Laws of Probability

SOV/43-59-1-2/17

$$+\sum_{n=0}^{\infty}\lambda_n\left(e^{-it\nu_n}-1+\frac{it\nu_n}{1+\nu_n^2}\right),$$

where $\gamma \geqslant 0$ (the Gauss component may also be absent). Then (1) holds for all real and complex values t_k, and all $f_j(t)$ have logarithms of the type (2).
The theorem generalizes a corresponding statement from [Ref 3] and is proved in a quite similar way. The author mentions D.A.Raykov.
There are 7 references, 6 of which are Soviet, and 1 English.

SUBMITTED: September 16, 1957

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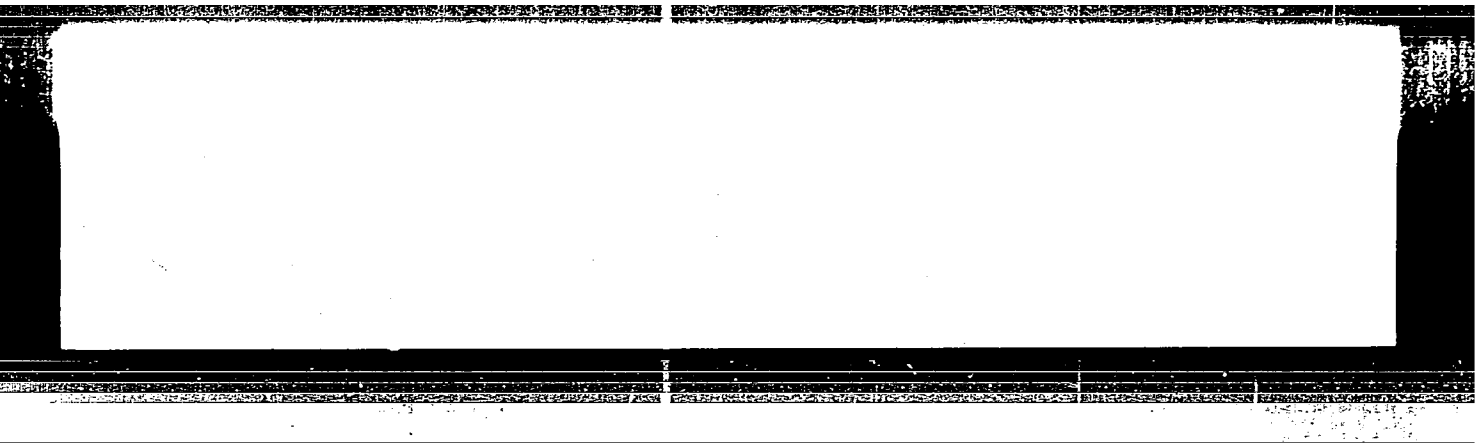

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

TERENT'YEV, P.V.; LINNIK, Yu.V.

Conference on the use of mathematical methods in biology. Teor.veroiat. i ee prim. 4 no.1:114-116 '59. (MIRA 12:3)
(Biomathematics--Congresses)

[illegible] Unbounded [illegible]

PERIODICAL: Teoriya veroyatnostey i yeye primeneniya, 1959, Vol 4, No 2, pp 150-171 (USSR)

ABSTRACT: The principal theorem of the author [Ref 1] formulated in the preceding paper II is proved in the following more general form: Theorem: Let the infinitely divisible law F have the characteristic function $\varphi(t)$:

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

$$\ln \varphi(t) = \beta it - \gamma t^2 + \sum_{m=1}^{\infty} \lambda_m \left(e^{\frac{it\mu_m}{1+\mu_m^2}} - 1 - \frac{it\mu_m}{1+\mu_m^2} \right) + \sum_{n=1}^{\infty} \lambda_{-n} \left(e^{-it\nu_n} - 1 + \frac{it\nu_n}{1+\nu_n^2} \right),$$

where $\lambda_m \geq 0$, $\lambda_{-n} \geq 0$, $\sum_{n=1}^{\infty} \frac{\lambda_m \mu_m^2}{1+\mu_m^2}$ and $\sum_{n=1}^{\infty} \frac{\lambda_{-n} \nu_n^2}{1+\nu_n^2}$ converge and

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

General Theorems on the Factorization of Infinitely Divisible Laws III. Sufficient Conditions (Countable Bounded Poisson Spectrum. Unbounded Spectrum."Stability") SOV/52-4-2-3/13

$\sum_{\mu_m<\varepsilon} \lambda_m \mu_m^2 + \sum_{\nu_n<\varepsilon} \lambda_n \nu_n^2 \to 0$ for $\varepsilon \to 0$. Let the Poisson-frequencies μ_n and ν_n be given by the number sequences

$$\ldots, k_{-1}k_{-2}\mu, k_{-1}\mu, \mu, \frac{\mu}{k_1}, \ldots, \frac{\mu}{k_1 k_2 \ldots k_n}, \ldots$$

$$\ldots, l_{-1}l_{-2}\nu, l_{-1}\nu, \nu, \frac{\nu}{l_1}, \ldots, \frac{\nu}{l_1 l_2 \ldots l_n},$$

where $k_j, l_j \geq 1$ and for sufficiently large $\mu_n > \mu$, $\nu_n > \nu$ it holds

$$\ln \ln \frac{1}{\lambda_n} > c\,\mu_m^{1+\alpha}, \quad \ln \ln \frac{1}{\lambda_{-n}} > c\,\nu_n^{1+\alpha},$$

where $c > 0$ and $\alpha > 0$ are positive constants. Then F has only infinitely divisible components.

A further theorem asserts that if a law in a certain sense is

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

General Theorems on the Factorization of Infinitely Divisible Laws III. Sufficient Conditions (Countable Bounded Poisson Spectrum. Unbounded Spectrum."Stability") SOV/52-4-2-3/13

little different from an infinitely divisible law, then its components are also neighboring to the infinitely divisible components.
There are 5 references, 3 of which are Soviet, 1 Swedish, and 1 English.

SUBMITTED: October 31, 1957

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APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.

Five lectures on some topics of the number theory and of the probability theory. Mat. fiz. kurs MTA 4 no.1/[illegible] 'W. (KRAI 9:9)

1. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A. Steklova Akademii nauk SSSR.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

16(1)

AUTHOR: Linnik, Yu.V. SOV/52-4-3-4/10

TITLE: An Information Theoretic Proof of the Central Limit Theorem Under Lindeberg Conditions

PERIODICAL: Teoriya veroyatnostey i yeye primeneniye, 1959, Vol 4, Nr 3, pp 311-321 (USSR)

ABSTRACT: The author proposes a new proof of the central limit theorem. The proof is based on information theoretical properties of the summation of random variables and uses the "information function"

information sets of Shannon and Fisher and gives an information theoretical interpretation of the conditions of Lindeberg.

The author mentions I.V.Romanovskiy.

There are 1 figure and 1 non-Soviet reference, which is American.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

SUBMITTED: December 25, 1958

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

16(1) 06311

AUTHORS: Kubilyus,I.P., and Linnik,Yu.V. SOV/140-59-6-12/29

TITLE: Arithmetic Modelling of the Motion of Brown

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Matematika, 1959, Nr 6, pp 88-95 (USSR)

ABSTRACT: Let $N_u\{\ldots\}$ be the number of natural numbers $m \leqslant u$ satisfying the conditions given in the braces $\{\ldots\}$. Let $P>1$ be an odd number free of squares and $\left(\frac{m}{P}\right) = \prod_{p|P}\left(\frac{m}{p}\right)$, where p runs through all prime divisors of P and $\left(\frac{m}{p}\right)$ is the Legendre's symbol. Let

$$S_p(m,s,t;h) = \frac{1}{\sqrt{h}} \sum_{hs<n\leqslant ht} \left(\frac{m+n}{P}\right), \quad 0 \leqslant s \leqslant t.$$

Theorem 1: If P runs through an increasing infinite sequence of odd numbers free of squares, where for every $c \geqslant 0$ it holds

(1) $\prod_{p|P}\left(1-\frac{c}{p}\right) \to 1$ for $P \to \infty$, $h = h(P) \to \infty$, $\log h/\log P \to 0$, then

(2) $$\frac{1}{P} N_P\left\{S_p(m,s,t,h) < x\right\} \to \frac{1}{\sqrt{2\pi(t-s)}} \int_{-\infty}^{x} e^{-\frac{u^2}{2(t-s)}}\, du$$

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Arithmetic Modelling of the Motion of Brown

and for an arbitrary choice of disjoint intervals $(s_1,t_1),\ldots,(s_k,t_k)$, $0\leq s_j\leq t_j$ $(j=1,\ldots,k)$ it holds

$$(3)\quad \frac{1}{P}N_P\left\{S_P(m,s_1,t_1,h)<x_1,\ldots,S_P(m,s_k,t_k,h)<x_k\right\}\longrightarrow$$
$$\longrightarrow\prod_{j=1}^{k}\lim_{p\to\infty}\frac{1}{P}N_P\left\{S_P(m,s_j,t_j,h)<x_j\right\}.$$

An analogous result (theorem 2) holds for characters of higher order. A series of proposals of programming for the calculation of the symbols of Legendre and Jacobi is given.
There are 6 references, 1 of which is Soviet, 1 Swedish, 1 American, 1 French, and 2 Italian.

ASSOCIATION: Vil'nyusskiy gosudarstvennyy universitet imeni V.Kapsukasa (Vil'nyus State University imeni V.Kapsukas)
Leningradskiy gosudarstvennyy universitet imeni A.A.Zhdanova (Leningrad State University imeni A.A.Zhdanov)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.

On "d-factorization" of infinitely divisible probability laws. (MIRA 12:4)
Vest.LGU 14 no.1:14-23 '59.
(Probabilities)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

16(1) SOV/42-14-3-5/22

AUTHORS: Smirnov, V.I., Linnik, Yu.V.

TITLE: Nikolay Sergeyevich Koshlyakov; in Memoriam

PERIODICAL: Uspekhi matematicheskikh nauk, 1959, Vol 14, Nr 3, pp 115-122 (USSR)

ABSTRACT: This is a memory on Nikolay Sergeyevich Koshlyakov, Corresponding Member, Academy of Sciences, USSR, Doctor of Physico-Mathematical Sciences, who died on September 23, 1958 at the age of sixty-seven in Moscow. He was a follower of A.A. Markov, V.A. Steklov, Ya.V. Uspenskiy, Professor A.A. Adamov, Yu.V. Sokhotskiy. Followers of the deceased are : I.V. Kurchatov, Academician, D.I. Shcherbakov, Academician, and Professor L.G. Loytsyanskiy. A list of the publications of N.S. Koshlyakov from 1912-1958 with 68 titles is given. A photo of the deceased is added.
G.F. Voronoy is mentioned in the paper.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

16(1) SOV/42-14-3-10/22

AUTHOR: Linnik, Yu.V.

TITLE: Some Remarks on the Estimation of Trigonometric Sums

PERIODICAL: Uspekhi matematicheskikh nauk, 1959, Vol 14, Nr 3, pp 153-160 (USSR)

ABSTRACT: Theorem : Let $p_1 \leq p$, $f(x) = \alpha_n(x) + P(x)$, where $\alpha_n(x) = \alpha_0 + \alpha_1 x + \dots + \alpha_n x^n$, α_i real , $P(x)$ integral polynomial mod p with the degree $\nu > n$. Then it is

$$\left| \sum_{x=0}^{p_1} \exp 2\pi i \left(\alpha_n(x) + \frac{1}{p} P(x)\right) \right| \leq c_1 (2\sqrt{2})^n \, p^{1 - \frac{1}{2^{n+1}}} \nu^{\frac{1}{2^n}} \lg p$$

Theorem : The congruence system

$$\begin{aligned} x_1^n + \dots + x_g^n &\equiv N_n \pmod{p^\lambda} \\ \dots\dots\dots\dots\dots\dots\dots\dots & \\ x_1 + \dots + x_g &\equiv N_1 \pmod{p^\lambda} \end{aligned}$$

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Some Remarks on the Estimation of Trigonometric Sums SOV/42-14-3-10/22

is solvable for $p > n$, $\lambda \geq 1$, if $g \geq c_0 n^2 \ln n$; the N_1 may be arbitrary.

A further theorem of related contents is given. The author mentions I.M. Vinogradov, A.N. Andrianov, K.K. Mardzhanishvili, G.V.Yemel'yanov.

There are 7 references, 5 of which are Soviet, 1 American, and 1 German.

SUBMITTED: May 16, 1958

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APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

ALEKSANDROV, A.D.; AKILOV, G.P.; ASHKEVITS, I.Ya.; VALLANDER, S.V.; VLADIMIROV, D.A.; VULIKH, B.Z.; GABURIN, M.K.; KANTOROVICH, L.V.; KOLBINA, L.I.; LOZINSKIY, S.M.; LADYZHENSKAYA, O.A.; LINNIK, Yu.V.; LEBEDEV, N.A.; MIKHLIN, S.G.; MAKAROV, B.M.; MATANSON, I.P.; NIKITIN, A.A.; POLYAKHOV, N.N.; PINSKER, A.G., SMIRNOV, V.I.; SAFRONOVA, G.P.; SMOLITSKIY, Kh.L.; FADDEYEV, D.K.

Grigorii Mikhailovich Fikhtengol'ts; obituary. Vest. LGU 14 no.19: 158-159 '59. (MIRA 12:9)
(Fikhtengol'ts, Grigorii Mikhailovich, 1888-1959)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

16(1) SOV/20-124-1-6/69

AUTHOR: Linnik, Yu.V., Corresponding Member, Academy of Sciences,USSR

TITLE: The Problem of Hardy - Littlewood on the Addition of Prime Numbers and two Squares (Problema Gardi - Littl'vuda o slozhenii prostykh chisel i dvukh kvadratov)

PERIODICAL: Doklady Akademii nauk SSSR,1959,Vol 124,Nr 1,pp 29-30 (USSR)

ABSTRACT: Theorem: All sufficiently large numbers are sums of a prime number and of two squares. The formula for the number of solutions of $n = p + \xi^2 + \eta^2$ of Hardy - Littlewood is correct, whereby it holds for the remaining term $R(n)$: $R(n) = O(n(\ln n)^{-C})$, where $C>0$ is an arbitrarily large constant.
The proof is based on the dispersion method of the author described in [Ref 4] .
There are 6 references, 3 of which are Soviet, and 3 Swedish.

ASSOCIATION: Leningradskoye otdeleniye Matematicheskogo instituta imeni V.A. Steklova Akademii nauk SSSR (Leningrad Section of the

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The Problem of Hardy - Littlewood on the Addition of Prime Numbers and two Squares SOV/20-124-1-6/69

Mathematical Institute imeni V.A. Steklov AS USSR)

SUBMITTED: October 9, 1958

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APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yuriy Vladimirovich; IL'INA, M.Ye., red.; ZHUKOVA, Ye.G., tekhn.red.

[Theory of the expansion of the laws of probabilities] Razlozheniia veroiatnostnykh zakonov. Leningrad, Izd-vo Leningr.univ., 1960. 263 p. (MIRA 13:10)
(Probabilities)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

Zhurnal, Yer. V.

PHASE I BOOK EXPLOITATION SOV/4981

Soveshchaniye po teorii veroyatnostey i matematicheskoy statistike, Yerevan, 1958

Trudy Vsesoyuznogo soveshchaniya po teorii veroyatnostey i matematicheskoy statistike, Yerevan, 19-25 sentyabrya 1958 g. (All-Union Conference on the Theory of Probability and Mathematical Statistics. Held in Yerevan 19-25 September, 1958. Transactions) Yerevan, Izd-vo AN ASSR, 1960. 291 p. Errata slip inserted. 2,500 copies printed.

Sponsoring Agency: Akademiya nauk Armyanskoy SSR.

Editorial Staff: G.A. Ambartsumyan, B.V. Gnedenko, Ye.B. Dynkin, Yu.V. Linnik and S. Kh. Tumanyan; Ed. of Publishing House: A.G. Sikuni; Tech. Ed.: M.A. Kaplanyan.

PURPOSE: The book is intended for mathematicians.

COVERAGE: The book contains 41 articles submitted to the Conference and dealing with the theory of probability and mathematical statistics. Some of the articles are the papers read at the Conference and edited for publication, while others outline the theses of papers which appeared or are scheduled to appear, wholly or in

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part, in other publications; in some cases, such publications are quoted. A list of the papers whose contents were published elsewhere is included and the places of publication are indicated. Individual articles examine theories of mass service, spectral instruments, numbers, games, and certain functions, and discuss the theorems of Shannon, Markov's chains, and certain processes, quantities, and functions. Such items as the method of least squares, the stochastic, Markov's and diffusion processes, measures and their applications, a scheme of Bernoulli experiments, Markov-type random fields, visible distribution of stars, Brownian motion, capacity of radio channels, and defective products are considered. No personalities are mentioned. References accompany some of the articles.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.

"On the Probability of Large Deviations for the Sum of Independent Variables."

[Academy of Sciences USSR]

report to be presented 23 June 1960 at the 4th Symposium on Mathematics Statistics and Probability - Berkeley, California, 20 Jun- 30 Jul 1960.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V. (Leningrad)

Considerations pertaining to the theory of large deviations.
Teor. veroiat. i ee prim. 5 no.2:261-262 '60. (MIRA 13:9)
(Probabilities)

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C111/C222

AUTHOR: Linnik, Yu. V.

TITLE: Asymptotic Formula in the Additive Problem of Hardy-Littlewood

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya matematicheskaya, 1960, Vol. 24, No. 5, pp. 629 - 706

TEXT: The present paper is a continuation of (Ref. 2) and the author uses the same notations and the results of (Ref. 2). He investigates the number of solutions of the equation of Hardy-Littlewood

(0.1) $$n = p + \xi^2 + y^2 \quad .$$

The author proves the theorem:

(0.2) $$Q(n) = \pi \frac{n}{\ln n} \prod_{p} \left(1 + \frac{\chi_4(p)}{p(p-1)}\right) \prod_{p/n} \frac{(p-1)(p-\chi_4(p))}{p^2-p+\chi_4(p)} + R(n) \quad ,$$

where

(0.3) $$R(n) = O\left(\frac{n}{(\ln n)^{1,028}}\right) \quad .$$

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Asymptotic Formula in the Additive Problem of Hardy-Littlewood

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Here in (0.2) it holds

$$(0.4) \qquad \prod_{p/n} = O(\ln \ln n) \quad , \quad \left(\prod_{p/n} \right)^{-1} = O(\ln \ln n) \; .$$

Because of a false conclusion the author contradicts his earlier result (Ref. 3), where (0.2) was given with $R(n) = O(n (\ln n)^{-c})$, $c>0$ arbitrary constant.
Let

$$(1.1) \qquad P = \exp \left(\frac{\ln n \ln \ln \ln n}{K \ln \ln n} \right) \; ,$$

where $K > 100$ is the constant introduced in (Ref. 2). Let Ω_p be the set of integers the prime divisors of which are $> P$. Let Y'_k denote the equation

$$(1.2) \qquad n = x'_1 x'_2 \ldots x'_k + \xi^2 + y^2$$

where $x'_i \in \Omega_p$ and let $Q_k(n)$ be the number of solutions of Y'_k . For

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Asymptotic Formula in the Additive Problem of Hardy - Littlewood

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$k = 7,8,\ldots, r_1$, where

$$(1.4) \qquad r_1 \leq \frac{K \ln \ln n}{\ln \ln \ln n} = r_e$$

in (Ref. 2) the author gave an asymptotic formula for $Q_k(n)$. The case $k \leq 6$ contains difficulties. In (Ref. 2). the equations Y_4' , Y_3' , Y_2' , Y_1' are solved with a sufficiently good asymptotic behavior. With the aid of a principal lemma the method applied in (Ref. 2) for $k = 1,2,3,4$ is extended in the present paper to the cases $k = 5,6$. This principal lemma corresponds to the lemma 5 of (Ref. 2); however, the original wording of the lemma of (Ref. 2) cannot be proved for $k = 5,6$ so that the principal lemma is only an averaging of the lemma 5 of (Ref. 2) for several moduli D. The proof of this principal lemma and the assertion (0.2) is subdivided into 60 points.

The author mentions B.V. Gnedenko and A.I. Vinogradov. There are 9 references: 7 Soviet and 2 Swedish.

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Asymptotic Formula in the Additive Problem of Hardy - Littlewood

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C111/C222

ABSTRACTER'S NOTE: [(Ref. 2) concerns Linnik, Yu.V., Matematicheskiy sbornik, 1960, Vol. 52, No. 2, pp 661 - 700]

SUBMITTED: April 20, 1960

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

S/030/60/000/012/003/018
B004/B056

AUTHOR: Linnik, Yu. V., Corresponding Member AS USSR

TITLE: Second Hungarian Congress on Mathematics

PERIODICAL: Vestnik Akademii nauk SSSR, 1960, No. 12, p. 78

TEXT: The second Hungarian Congress on Mathematics took place in Budapest from August 24 to August 31, 1960, and was convened in memory of Janos Bolyai, one of the founders of non-euclidean hyperbolic geometry. This was the 100-th anniversary of his death. Academicians B. Alexics and T. Rajos spoke about the achievements of this great mathematician. The congress was attended by delegates from 25 countries. 311 lectures, among which 127 by Hungarian scientists, were delivered. The successful development in various fields was stressed: mathematical logic, theoretical computer mathematics, applied theory of probability, linear and stochastic programing, classical and functional analytics, discrete and differential geometry, multiple topology, analytical theory of numbers, and number geometry. The following are mentioned as insufficiently

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developed: The theory of chance, algebraic topology, homologic algebra. Mention is made of Hungarian lectures on a computer which programs in mathematical language of formulas and on the theory of programing in the case of "Algol 60". Further, two digital computers are mentioned, one of which is used for medical diagnostics. Mention is further made (without giving a name) of a Soviet lecture on the solution of traffic problems by means of a computer. It is described to be a disadvantage of the Congress that no comprehensive lectures were held and that no exchange of opinions took place at the sessions without a definite program.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V. (Leningrad)

Some additive problems. Mat. sbor. 51 no.2:129-154 Je '60.
(MIRA 13:9)

(Numbers, Theory of)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

84289
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B111/B222

AUTHOR: Linnik, Yu.V. (Leningrad)

TITLE: All large numbers are sums of a Prime Number and Two Squares (On the Problem of Hardy-Littlewood)

PERIODICAL: Matematicheskiy sbornik, 1960, Vol.52, No.1, pp.661-700

TEXT: In (Ref.2) the author introduced the notion of the so-called dispersion of an equation and basing on it, he developed the so called "dispersion method" by a modification of the well-known methods of I.M.Vinogradov. In the present paper the author uses this method for solving the Hardy-Littlewood equation

(0.1) $$n = p + \xi^2 + \eta^2$$

for large n.

Theorem 1: For sufficiently large n, the number Q(n) of solutions of (0.1) satisfies the inequation

(0.2) $$Q(n) > 0.979\,\pi\,\frac{n}{\ln n}\prod_{p}\left(1+\frac{\chi_4(p)}{p(p-1)}\right)\cdot\prod_{p/n}\frac{(p-1)(p-\chi_4(p))}{p^2-p+\chi_4(p)}\,.$$

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All Large Numbers are Sums of a Prime Number and Two Squares (to the Problem of Hardy-Littlewood).I.

Here $\left(\prod_{p/n} \frac{(p-1)(p-\chi_4(p))}{p^2-p+\chi_4(p)} \right)^{-1} = O(\ln \ln n)$, so that $Q(n)$ is very large.

Let $P = \exp \frac{\ln n \ln \ln \ln n}{K \ln \ln n}$, where K is a sufficiently large constant.

Let $L(n) = \sum_{\substack{p_1 p_2 \leq n \\ p_1 > P}} 1$. Let $S(n)$ be the number of solutions of

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

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C111/C222

All Large Numbers are Sums of a Prime Number and Two Squares (to the Problem of Hardy-Littlewood).I.

The author states that with the aid of the present paper the equation

(0.5) $n = p+Q(\xi,\eta)$

can be solved, where $Q(\xi,\eta) = a\xi^2+b\xi\eta+c\eta^2$ is a primitive positive quadratic form and $n > n_o = n_o(Q)$.

In (Ref.3) the author asserted that the hypothesis of Hardy and Littlewood (Ref.1) is correct, namely that Q(n) is represented asymptotically by (0.2) if in (0.2) 0.979 is replaced by 1. Because of a false conclusion the author now contradicts his assertion and the presentation of the corresponding remainder term for Q(n) given in (Ref.3).
The author mentions K.Ye.Chernin, A.I.Vinogradov and N.G.Chudakov.
There are 14 references: 10 Soviet, 2 Swedish, 1 German and 1 English.

SUBMITTED: October 1, 1959

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APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

AUTHOR: Linnik, Yu.V., Corresponding Member of the Academy of Sciences USSR

TITLE: The Sixth Moment for the L-Series and an Asymptotic Formula in the Problem of Hardy-Littlewood

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol.133, No.5, pp.1015-1016.

TEXT: Let p be a prime number; ξ, η - integers. The equation

(1) $$n = p + \xi^2 + \eta^2$$

has a solution for all sufficiently large n. For the number Q(n) of the solutions of (1) there holds the asymptotic formula:

Theorem 1:

(2) $$Q(n) \sim \pi \frac{n}{\ln n} \prod_p \left(1 + \frac{\tau_4(p)}{p(p-1)}\right) \prod_{p/n} \frac{x^2(p-1)(p-\tau_4(p))}{p^2-p+\tau_4(p)} + R(n),$$

where

(3) $$R(n) = O\left(\frac{n}{(\ln n)^{1.028}}\right).$$

The author's earlier result (Ref.2) with a better R(n) is contradicted since in (Ref.2) there was a false conclusion.

In (Ref.2) the author showed that (1) can be reduced to equations

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

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The Sixth Moment for the L-Series and an Asymptotic Formula in the Problem of Hardy-Littlewood

(6) $\sum_{D_1 \leq D \leq D_1+D_2} \sum_{\chi_D} |L(\frac{1}{2} + it, \chi_D)|^6$

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The Sixth Moment for the L-Series and an Asymptotic Formula in the Problem of Hardy-Littlewood

be the sixth moment.
Theorem 2:

$$(7)\quad \sum_{D_1 \le D \le D_1+D_2} \sum_{\chi_D} \left| L\left(\tfrac{1}{2}+it, \chi_D\right)\right|^6 \ll BD_2D_1(|t|+1)^{l_0}\cdot\exp(\ln D_1)^{\varepsilon_0},$$

where B - bounded magnitude, $l_0 > 0$ - constant, $\varepsilon_0 > 0$ arbitrarily small constant.
The estimation (7) serves for the determination of the asymptotic behavior of Q(n) in the case k 6.
There are 3 references: 2 Soviet and 1 Swedish.

SUBMITTED: May 9, 1960

Card 3/3

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TEXT: Let $X_1, X_2, \ldots, X_n$ be independent equally distributed variables, $E(X_i) = 0$; $D(X_i) = \sigma^2 > 0$ and $Z_n = \dfrac{X_1+X_2+\ldots+X_n}{\sigma\sqrt{n}}$. Let $\psi(n) \to \infty$ monotonely. The sequence of intervals $[0, \psi(n)]$ is called the zone of normal convergence if for all $x \in [0, \psi(n)]$ and $n \to \infty$ it holds

$$(1)\quad \frac{P(Z_n > x)}{\frac{1}{\sqrt{2\pi}}\int_x^{\infty} e^{-\frac{u^2}{2}}\,du} \longrightarrow 1.$$

Theorem 1: In order that for all $\alpha < \frac{1}{2}$ the zones $[0, n^{\alpha}]$ and $[-n^{\alpha}, 0]$ are zones of normal convergence it is necessary and sufficient that all X_i are normal.

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New Limit Theorems for Sums of Independent Random Variables

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Theorem 2: Let $\varphi(n)\to\infty$ be arbitrarily slow and monotone, $0<\alpha<\frac{1}{2}$. If $\alpha<\frac{1}{6}$, then

(·) $\max |x_1|^{\frac{1\alpha}{2\alpha+1}}$ ...

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New Limit Theorems for Sums of Independent Random Variables

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the first $(s+3)$ moments of X_i must agree with the moments of the normal law. Both these conditions are sufficient in order that $[0, n^{\alpha}/\varphi(n)]$ and $[-n^{\alpha}/\varphi(n), 0]$ are zones of normal convergence.
Theorem 3 considers the case of the narrow zones $\psi(n) = o(n^{1/6})$.
Theorem 4 relates to variables X_i with a continuous bounded density.
Theorem 5 gives an assertion in a special case which holds on the whole x-axis.
There are 5 references: 3 Soviet, 1 English and 1 American.

ASSOCIATION: Leningradskoye otdeleniye Matematicheskogo instituta im. V.A.Steklova Akademii nauk SSSR (Leningrad Branch of the Mathematical Institute im.V.A.Steklov of the Academy of Sciences USSR)

SUBMITTED: May 9, 1960

Card 3/3

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

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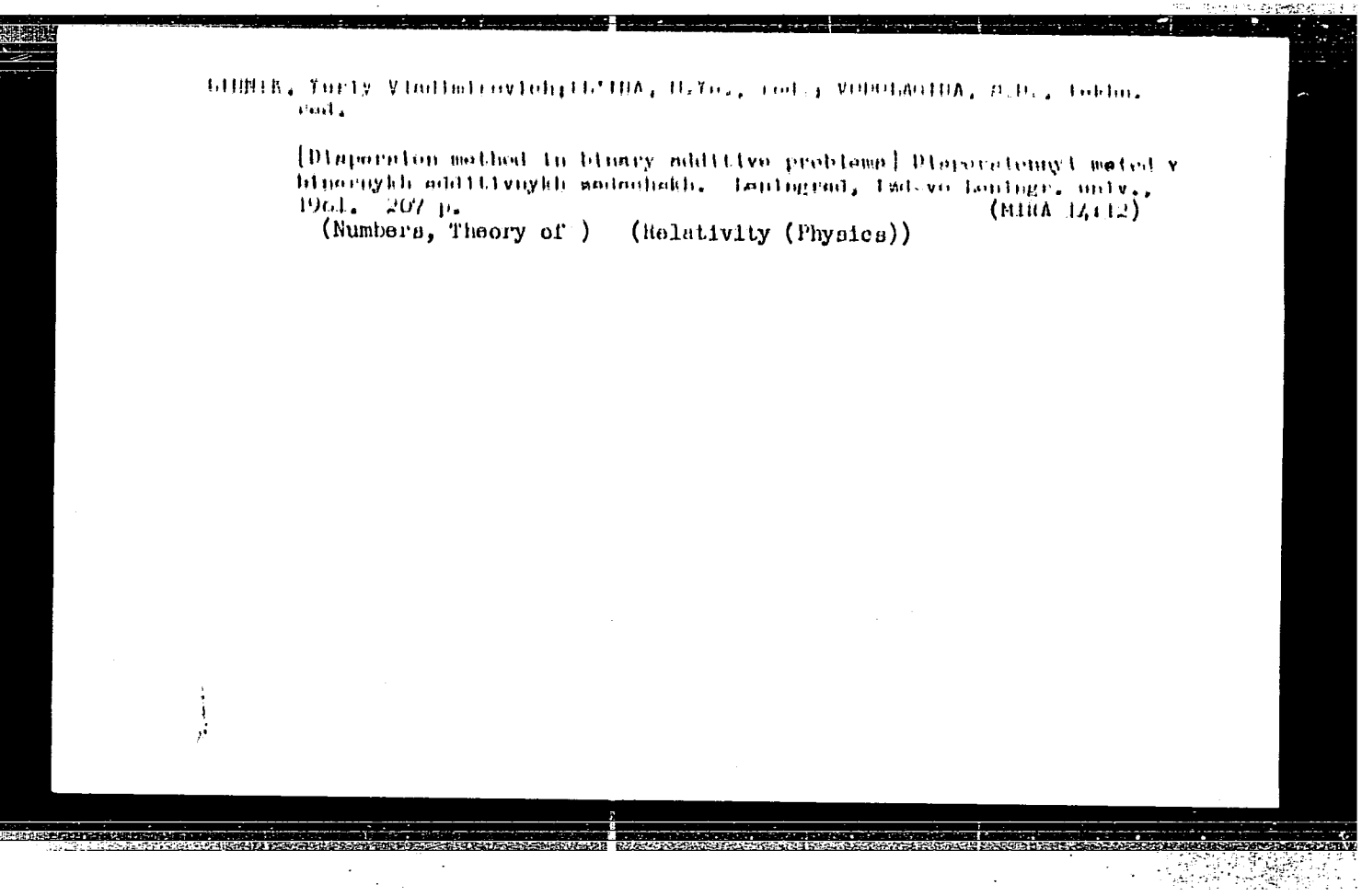

[illegible], Yuriy Vladimirovich; [illegible], N.Yu., red.; [illegible], S.D., tekhn. red.

[Dispersion method in binary additive problems] Dispersionnyi metod v binarnykh additivnykh zadachakh. Leningrad, Izd-vo Leningr. univ., 1963. 207 p. (MIRA 17:12)

(Numbers, Theory of) (Relativity (Physics))

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

16.6100 25014 S/052/61/006/002/001/006
C111/C222

AUTHOR: Linnik, Yu.V.

TITLE: Limit theorems for the sums of independent variables taking into account the big deviations

PERIODICAL: Teoriya veroyatnostey i yeye primeneniya, v.6, no.2, 1961, 145-163

TEXT: The paper contains the proofs for the results announced in (Ref. 14: Yu.V. Linnik, On the probability of large deviations for the sums of independent variables, Transactions of the IV Berkeley symposium on Prob. and Stat., 1960).
Let $X_1, X_2, \ldots, X_n$ be independent, equally distributed random terms, $E(X_1) = 0$, $D(X_1) = \sigma^2 < \infty$. Let

$$Z_n = \frac{X_1 + X_2 + \ldots + X_n}{\sigma\sqrt{n}} \quad . \qquad (0.1)$$

Let $\psi(n) \to \infty$ be a monotone function. The sequence of the intervals $[0, \psi(n)]$ is called the zone of normal attraction (z.n.a.) if

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$$\frac{P(Z_n > x)}{\frac{1}{\sqrt{2\pi}} \int_x^\infty e^{-u^2/2}\, du} \to 1 \quad . \tag{0.3}$$

If Z_n has the probability density $p_{Z_n}(x)$ then the zones of the local uniform normal attraction (z.l.u.n.a) are considered. The zone $[0, \psi(n)]$ is called a z.l.u.n.a if

$$\frac{p_{Z_n}(x)}{\frac{1}{\sqrt{2\pi}} e^{-x^2/2}} \to 1 \tag{0.4}$$

holds uniformly in $x \in [0, \psi(n)]$. In particular the author considers the z.n.a for which

$$\psi(n) = o(n^{1/6}) \quad ; \tag{0.5}$$

such zones are called "narrow".

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Let the random terms X_j have a bounded continuous probability density $g(x)$. Such X_j belong to the class (d). For $X_j \in (d)$ it is proved :

Theorem 1 : If the zones $[0, n^{\alpha}]$ and $[-n^{\alpha}, 0]$ for every $\alpha < \frac{1}{2}$ are z.l.u.n.a, then all variables X_j are normal.

Theorem 1 follows from

Theorem 2 : Let $\varphi(n) \to \infty$ be a monotone, arbitrarily slowly increasing function ; $0 < \alpha < \frac{1}{2}$. If $\alpha < \frac{1}{6}$ then

$$E \exp |X_j|^{\frac{4\alpha}{2\alpha+1}} < \infty \qquad (2.1)$$

is a necessary condition that the zones $[0, n^{\alpha} \varphi(n)]$, $[-n^{\alpha}\varphi(n), 0]$ are z.l.u.n.a . This condition is also sufficient that the zones

$\left[0, \frac{n^{\alpha}}{\varphi(n)}\right]$, $\left[-\frac{n^{\alpha}}{\varphi(n)}, 0\right]$ are z.l.u.n.a . If $\frac{1}{6} \leq \alpha < \frac{1}{2}$ then the series of "critical numbers"

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Limit theorems for the sums ...

$$\frac{1}{6}\ ,\ \frac{1}{4}\ ,\ \frac{3}{10}\ ,\ \ldots,\ \frac{1}{2}\ \frac{s+1}{s+3}\ ,\ \ldots \qquad (2.2)$$

is considered. Let $\frac{1}{2}\frac{s+1}{s+3} \leq \alpha < \frac{1}{2}\frac{s+2}{s+4}$. If the zones $\left[0, n^{\alpha}\varphi(n)\right]$, $\left[-n^{\alpha}\varphi(n),\ 0\right]$ are z.l.u.n.a then (2.1) must be valid, and all moments of X_j up to the $(s+3)^{rd}$ inclusively must agree with the moments of the normal law. These two conditions are sufficient that the zones $\left[0, \frac{n^{\alpha}}{\varphi(n)}\right]$, $\left[-\frac{n^{\alpha}}{\varphi(n)}\ ,\ 0\right]$ are z.l.u.n.a .

Theorem 3 : If $\alpha < \frac{1}{6}$ then (2.1) is necessary that the zones $\left[0, n^{\alpha}\varphi(n)\right]$, $\left[-n^{\alpha}\varphi(n),\ 0\right]$ are z.n.a . This condition is sufficient that the zones $\left[0, \frac{n^{\alpha}}{\varphi(n)}\right]$, $\left[-\frac{n^{\alpha}}{\varphi(n)}\ ,\ 0\right]$ are z.n.a; the convergence

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(0.3) in these zones is uniform.

The author mentions A.Ya. Khinchin, N.V. Smirnov, V.V. Petrov and V. Rikhter.

There are 8 Soviet-bloc and 7 non-Soviet-bloc references. The references to the four most recent English-language publications read as follows: H. Chernoff, Large simple theory : parametric case, Ann.Math.Stat.,27 (1956), 1 - 22 , J. Wolfowitz, Information theory for mathematicians, Ann.Math.Stat., 29 (1958), 351 - 356 , Yu.V. Linnik, On the probability of large deviations for the sums of independent variables, Transactions of the IV Berkeley Symposium on Prob. and Stat., 1960 , A. Erdelyi, Higher Transcendental Functions, II, N 4, 1953.

SUBMITTED: June 28, 1960

Card 5/5

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

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16.6100

AUTHOR: Linnik, Yu.V.

TITLE: Limit theorems for the sums of independent variables taking into account the big deviation. II.

PERIODICAL: Teoriya veroyatnostey i yeye primeneniye, v.6, no. 4, 1961, 377-391

TEXT: The paper is a continuation of an earlier one by Yu.V. Linnik (Ref. 16: Predel'nyye teoremy dlya summ nezavisismykh velichin pri uchete bol'shikh ukloneniy I [Limit theorems for the sums of independent variables taking into account the big deviations I] Teoriya vercyat i yeye primen., VI, 2 (1961), 145-162). The notations as in (Ref. 16) are used. The integral normal attraction zones (z.n.a.) for the variables X_i and the local normal attraction zones for $X_j \in (d)$ are considered. Given is a function h(x) of class I from (Ref. 16) . It satisfies the conditions

$$(\log x)^{2+\xi_0} \leq h(x) \leq x^{1/2}, \quad (x \geq 1) \qquad (0.2)$$

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

Limit theorems for the sums ...

$h(x) = \exp(H(\log x))$, where $H(z)$ is monotonic differentiable

$$H'(z) \leq 1 \; ; \; H'(z) \to 0 \quad \text{for} \quad z \to \infty \tag{0.3}$$

and

$$H'(z) \exp H(z) > c_1 z^{1+\zeta_1} \tag{0.4}$$

A new positive function $\Lambda(n)$ is defined by

$$h(\sqrt{n}\,\Lambda(n)) = (\Lambda(n))^2 \tag{0.5}$$

The following theorems are proven :
Theorem 1 : The condition

$$E \exp h(|X_j|) < \infty \tag{0.6}$$

where $h(x)$ belongs to class I, is necessary for the zones $[0, \Lambda(n)/\varphi(n), 0]$ to be z.n.a., and is sufficient for the zones $[0, \Lambda(n)/\varphi(n)]$; $[\Lambda(n)/\varphi(n), 0]$ to be z.n.a.
Theorem 2 : The statement of theorem 1 also applies for integral z.n.a., and the convergence in the corresponding zones is uniform. If $h(x)$ be

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Limit theorems for the sums ...

longs to class II, then $\Lambda(n)$ is defined by $\Lambda(n) = \sqrt{h(n)} = \sqrt{M(n) \log n}$. Theorems 3 and 4 contain the same statements as in theorems 1 and 2 for this case. If $h(x)$ belongs to class III, then $\Lambda(n) = \sqrt{\log n}$, and analogous statements hold accordingly (theorem 5).
There are 10 Soviet-bloc and 6 non-Soviet-bloc references.
The references to the four most recent English-language publications read as follows : H. Chernoff, Large sample theory : parametric case, Ann. Math. Stat., 27 (1956), 1-22 ; J. Wolfowitz, Information theory for mathematicians, Ann. Math. Stat., 29 (1958), 351-356 ; Yu.V. Linnik, On the probability of large deviations for the sums of independent variables. Transactions of the IV Berkeley Symposium on Prob. and Stat., 1961 ; A. Erdelyi, Higher Transcendental Functions, II, 4 (1953).

SUBMITTED: June 28, 1960.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.

S.N.Bernshtein's works on the theory of probability. Usp. mat. nauk 16 no.2:25-26 Mr-Ap '61. (MIRA 14:5)
(Probabilities) (Bernstein polynomials)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LIN[illegible], Yu.V.; LYAPIN, Ye.S.; [illegible] V.A.

Vladimir Abramovich Tartakovskiĭ on his 60th birth[illegible]. Vest. [illegible]. mat. nauk 16 no.5:225-230 S-O '61. (MIRA 14:10)
(Tartakovskiĭ, Vladimir Abramovich, 1[illegible]-)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.

New variants and new uses of the dispersion method in binary additive problems. Dokl.AN SSSR 137 no.6:1299-1302 Ap '61. (MIRA 14:4)

1. Chlen-korrespondent AN SSSR.
(Numbers, Theory of)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu. V.

"Additive problems and eigenvalues of modular operators"
To be presented at the IMU Interantional Congress of
Mathematicians 1962 - Stockholm, Sweden,15-22 Aug 62

Corresponding Member, Acad. of Sci. USSR.; Head,
Chair, Theory of Probability, Leningrad State Univ.(1961 position)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu. V.

"On similar regions in mathematical statistics"

report submitted at the Intl Conf of Mathematical Stockholm, Sweden, 15-22 Aug 62

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

GEL'FOND, Aleksandr Osipovich; LINNIK, Yuriy Vladimirovich. Prinimali uchastiye: VINOGRADOV, A.I.; MANIN, Yu.I.; KARATSUBA, A.A., red.; AKSEL'ROD, I.Sh., tekhn. red.

[Elementary methods in the analytical theory of numbers] Elementarnye metody v analiticheskoi teorii chisel. Moskva, Fizmatgiz, 1962. 269 p. (MIRA 16:3)
(Numbers, Theory of)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yuriy Vladimirovich; PETROV, V.V., red.; ROZENGAUZ, N.M., red.; LUK'YANOV, A.A., tekhn. red.

[Method of least squares and fundamentals of the theory of observation data processing in mathematical statistics]Metod naimen'shikh kvadratov i osnovy matematiko-statisticheskoi teorii obrabotki nabliudenii. Izd.2., dop. i ispr. Moskva, Fizmatgiz, 1962. 349 p. (MIRA 15:9)

(Least squares) (Mathematical statistics)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

VOROB'YEV, N.N., red.; GNEDENKO, B.V., red.; DOBRUSHIN, R.L., red.; DYNKIN, Ye.B., red.; KOLMOGOROV, A.N., red.; KUBILYUS, I.P. [Kubilius, I.P.], red.; LINNIK, Yu.V., red.; PROKHOROV, Yu.V., red.; SMIRNOV, N.V., red.; STATULYAVICHYUS, V.A.[Statuliavicius, V.A.], red.; YAGLOM, A.M., red.; MELINENE, D., red.; PAKERITE,O., tekhn. red.

[Transactions of the Sixth Conference on Probability Theory and Mathematical Statistics, and of the Colloquy on Distributions in Infinite-Dimensional Spaces]Trudy 6 Vsesoiuznogo soveshchaniia po teorii veroiatnostei i matematicheskoi statistike i kollokviuma po raspredeleniiam v beskonechnomernykh prostranstvakh. Vilnius, Palanga, 1960. Vil'nius, Gos.izd-vo polit. i nauchn. lit-ry Litovskoi SSR, 1962. 493 p. (MIRA 15:12)

1. Vsesoyuznoye soveshchaniye po teorii veroyatnostey i matematicheskoy statistike i kollokviuma po raspredeleniyam v beskonechnomernykh prostranstvakh. 6th, Vilnius, Palanga, 1960.
(Probabilities--Congresses) (Mathematical statistics--Congresses) (Distribution (Probability theory))--Congresses)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V. (Leningrad)

Limit theorems for sums of independent variables, taking large derivations into account. Part 3. "Broad" simple zones of integral uniform normal attraction. Teor. veroiat. i ee prim. 7 no.2:121-134 '62. (MIRA 15:5)
(Limit theorems (Probability theory))

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

GEL'FOND, A.O.; LINNIK, Yu.V.; CHUDAKOV, N.G.; YAKUBOVICH, V.A.; LINNIK, IU.V.; CHUDAKOV, N.G.; IAKUBOVICH, V.A.

An incorrect work of N.I.Gavrilov. Usp.mat.nauk 17 no.1:265-267 Ja-F '62. (MIRA 15:3)

(Functions, Zeta)
(Gavrilov, N.I.)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.; POSTNIKOV, A.G.

Ivan Matveevich Vinogradov; on his 70th birthday. Usp.mat.nauk 17 no.2:201-214 Mr-Ap '62. (MIRA 15:12)
(Vinogradov, Ivan Matveevich, 1891-)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.

Statistically similar zones of the linear type. Dokl. AN SSSR 144 no.5:974-976 Je '62. (MIRA 15:6)

1. Chlen-korrespondent AN SSSR.
(Mathematical statistics)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.

Theory of statistically similar zones. Dokl. AN SSSR 146 no.2:300-

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.; SKUBENKO, B.F.

Asymptotic behavior of third-order integral matrices. Dokl. AN SSSR 146 no.5:1007-1008 O '62. (MIRA 15:10)

1. Chlen-korrespondent AN SSSR (for Linnik).
(Matrices)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, YU.V.

"Behrens-Fisher problem"

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.

Application of the information theory to mathematical statistics.
Izv. AN SSSR. Tekh. kib. no.5:102 S-O '63. (MIRA 16:12)

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ACCESSION NR: AP3001460 S/0052/63/008/002/0217/0218

52

AUTHOR: Brovkovich, G. N.; Linnik, Yu. V. (Leningrad)

TITLE: Similar estimates using the method of least squares 16

SOURCE: Teoriya veroyatnostey i yeye primeneniya, v. 8, no. 2, 1963, 217-218

TOPIC TAGS: chi-square, regression, estimation, similar region

ABSTRACT: The observation that when X and Y are independent with the chi-square distribution, then X/Y and X + Y are independent leads to simple constructions of similar regions for certain parameters in certain regression models. Orig. art. has: 8 formulas, 1 figure and 1 table.

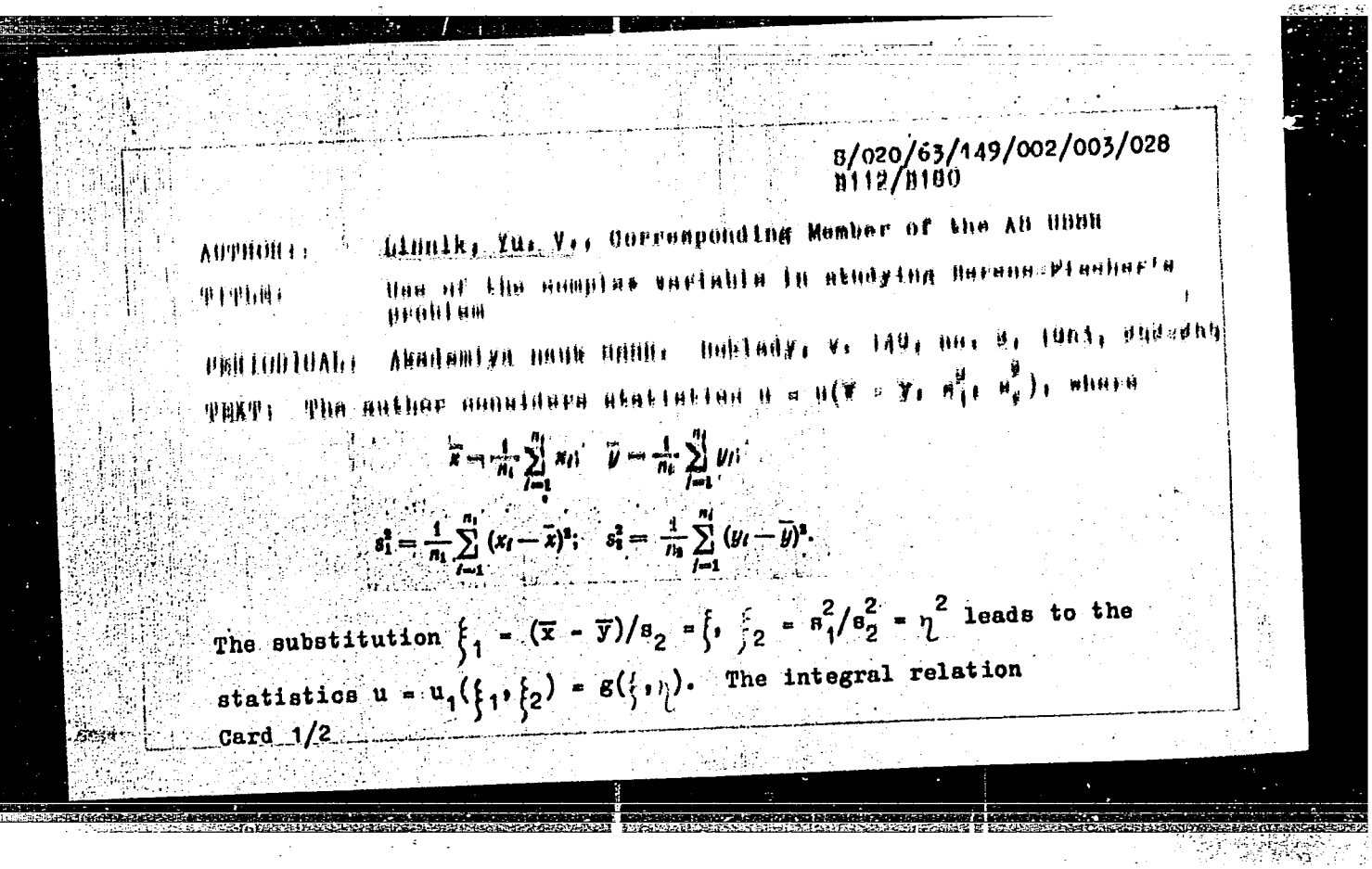
ASSOCIATION: none

SUBMITTED: 11Jan62 DATE ACQ: 17Jun63 ENCL: 00

SUB CODE: 00 NO REF SOV: 002 OTHER: 001

Card 1/1

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1



S/020/63/149/002/003/028
B112/B180

AUTHOR: Linnik, Yu. V., Corresponding Member of the AS USSR

TITLE: Use of the complex variable in studying Behrens-Fisher's problem

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 149, no. 2, 1963, 269-271

TEXT: The author considers statistics $u = u(\bar{x} - \bar{y}, s_1^2, s_2^2)$, where

$$\bar{x} = \frac{1}{n_1}\sum_{l=1}^{n_1} x_l, \quad \bar{y} = \frac{1}{n_2}\sum_{l=1}^{n_2} y_l,$$

$$s_1^2 = \frac{1}{n_1}\sum_{l=1}^{n_1}(x_l - \bar{x})^2; \quad s_2^2 = \frac{1}{n_2}\sum_{l=1}^{n_2}(y_l - \bar{y})^2.$$

The substitution $\xi_1 = (\bar{x} - \bar{y})/s_2 = \xi$, $\xi_2 = s_1^2/s_2^2 = \eta^2$ leads to the statistics $u = u_1(\xi_1, \xi_2) = g(\xi, \eta)$. The integral relation

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Use of the complex variable in...

$$\iint_{\Omega} \psi(g(\xi, \eta)) \frac{\eta^{n_1-1} d\xi\, d\eta}{(\theta^2 + \theta(1+\xi^2+\eta^2)+\eta^2)^N} = C_\psi \theta^{-n_1/2} (1+\theta)^{-N+1/2}, \qquad (1)$$

is derived, where $\psi(g) = 1$ for $C < g < C + \Delta C$, and $\psi(g) = 0$ otherwise; $N = (n_1 + n_2)/2 - 1/2$, $\gamma = n_2/n_1$. The right-hand side of (1) is investigated by analytic continuation with respect to the complex parameter $\theta = \sigma + it$.

SUBMITTED: December 29, 1962

Card 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

S/020/63/149/003/003/028
B112/B180

AUTHORS: Linnik, Yu. V., Corresponding Member AS USSR, Mitrofanova, N.M.

TITLE: Asymptotic behavior of the maximum likelihood

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 149, no. 3, 1963, 518- 520

TEXT: A function $f(x,\vartheta)$ of the form $ce^{-F(x-\vartheta)}$ is considered, which fulfils the following conditions: (A) The derivatives $\partial \ln f/\partial\vartheta$, $\partial^2 \ln f/\partial\vartheta^2$, $\partial^3 \ln f/\partial\vartheta^3$ exist for $\vartheta \in \Theta$ and almost all x's. (B) $|\partial f/\partial\vartheta| < F_1(x)$, $|\partial^2 f/\partial\vartheta^2| < F_2(x)$, $|\partial^3 \ln f/\partial\vartheta^3| < H(x)$ for $\vartheta\in\Theta$; F_1, F_2 are integrable on $(-\infty, +\infty)$ and $\int_{-\infty}^{+\infty} H(x)f(x,\vartheta)dx < M$, M independent of ϑ. (C) $\int_{-\infty}^{+\infty} (\partial \ln f/\partial\vartheta)^2 f dx$ is finite and positive. The equation of likelihood is written in the form $\sum_{i=1}^{n} F'(x_i - \vartheta) = 0$. (1). The following two

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theorems are derived: 1. Let the true value of the parameter ϑ be equal to zero and let $F(x)$ satisfy the following conditions: 1. $F(x)$ has $k+2$ derivatives ($k>0$). 2. $|F^{(i)}(x)| < \exp(\ln(|x|+1))^{m_i}$ for certain values m_i ($i = 1,2,\ldots,k+2$). 3. $E\exp(b_i|F^{(i)}(x)|) < \infty$ for certain values $b_i > 0$, $i = 1,2,\ldots,k+1$. 4. The conditions (B) and (C) are fulfilled. 5. $x\ln(x)/F(x) \to 0$ for $x \to \pm\infty$. Then the following asymptotic expansion will be valid:

$$P(\hat{\theta}_n\sqrt{n} < x) = \Phi\left(\frac{x}{\varkappa}\right) + \sum_{j=1}^{\left[\frac{k-1}{2}\right]} n^{-j/2}K_j\left(\frac{x}{\varkappa}\right) + o\left(\frac{\ln n}{\sqrt{n}}\right)^{\left[\frac{k-1}{2}\right]};$$

Here, $K_j(x)$ are certain continuous functions which may be constructed effectively, and $\varkappa^2$ is the lower Rao-Kramer boundary for the dispersion of the estimate of ϑ. 2. If $F(x)$ satisfies the same conditions as in theorem 1 and if $F^{(i)}(x) > c_0 > 0$ for a certain i ($3 \leq i \leq k+2$), then the estimate of the maximum likelihood $\hat{\vartheta}_n$ has a self-dispersion, and

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$D(\hat{\vartheta}_n \sqrt{n}) = \varkappa^2 + O(1/\sqrt{n})$.

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S/020/63/149/005/002/018 52

AUTHOR: Linnik, Yu. V., Corresponding Member of the Academy of [redacted]

TITLE: Complex variables in the problems of mixed parameters and sufficient statistics of finite rank 16

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 149, no. 5, 1963, 1026-1028

TEXT: In the previous paper (DAN, v. 149, no 2, 1963) author applied methods of analytic continuation of the parameter to the simple version of the problem of Berens-Fisher. This paper applies the methods of analytic continuation to the testing of hypotheses and interval evaluation in the case of mixed parameters. The problem of testing of the hypothesis H_0 under usual assumptions is reduced to the investigation of existence of a non-trivial, measurable function g which depends on the given statistics of the set of samples and does not depend on the parameters θ under H_0.

Some conditions of existence of g are obtained. The method of analytic continuation is then applied to derivation of explicit formulas for the test function g in the case of homogenous problem of Barens-Fisher and the problem of normal samples.

SUBMITTED: January 18, 1963

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AUTHOR: Linnik, Yu. V. (Corresponding Member, AN SSSR); Shalayevskiy, O. V.

TITLE: Analytic theory of tests for the Behrens-Fisher problem 16

SOURCE: AN SSSR. Doklady, v. 150, no. 1, 1963, 26-27

TOPIC TAGS: Behrens-Fisher problem

ABSTRACT: Let $g(\xi, \eta)$ be a test such that for any semi-circle $K \subset \Omega = \{-\infty<\xi<+\infty, 0\leq\eta<\infty\}$ with center at the origin, then either

$$\text{vrai}\max_K g(\xi, \eta) < \text{vrai}\max_\Omega g(\xi, \eta),$$

or

$$\text{vrai}\min_K g(\xi, \eta) > \text{vrai}\min_\Omega g(\xi, \eta).$$

Using analytic continuation, it is shown that $g(\xi, \eta)$ cannot exist. Author also states (without proof) conditions on the critical zone under which a similar test fails to exist. Orig. art. has: 2 formulas.

ASSOCIATION: Leningradskoye otdeleniye Matematicheskogo instituta im. V. A. Steklova Akademii nauk SSSR (Leningrad Division of the Mathematics Inst., Academy of Sciences SSSR

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LINNIK, Yu.V.

A.Wald's test. Dokl. AN SSSR 150 no.2:254-255 My '63.
(MIRA 16:5)

1. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A.Steklova AN SSSR. Chlen-korrespondent AN SSSR.
(Mathematical statistics) (Probabilities)

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LINNIK, Yu.V.

Theory of tests for two normal samples. Dokl. AN SSSR 152 no.3:548-549 S '63. (MIRA 16:12)

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LINNIK, Yu.V. (Leningrad)

Wald's test for comparing two normal samples. Teor. verciat. i ee prim. 9 no.1:16-30 '64. (MIRA 17:4)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

ZINGER, A.A.; LINNIK, Yu.V. (Leningrad)

Polynomial statistics for the normal and related laws. Teor. veroiat. i ee prim. 9 no.3:547-553 '64.

(MIRA 17:10)

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ZINGER, A.A.; LINNIK, Yu.V. (Leningrad)

Characteristics of normal distribution. Teor. veroiat. i ee prim. 9 no.4:692-695 '64. (MIRA 17.12)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

KAGAN, A. M.; LINNIK, Yu. V.

A class of families of distributions admitting similar zones.
Vest. LGU 19 no.7:16-18 '64. (MIRA 17:7)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.; SKUBENKO, B.F.

Asymptotic distribution of third-order integral matrices.
Vest. LGU 19 no.13:25-36 '64 (MIRA 17:8)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000930010016-1

LINNIK, Yu.V.

Randomized uniform tests for the Behrens-Fisher problem. Izv. AN SSSR. Ser. mat. 28 no.2:249-260 Mr-Ap '64. (MIRA 17:3)

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ACCESSION NR: AP4013318 S/0020/64/154/003/0514/0516

AUTHORS: Linnik, Yu. V. (Corresponding member)

TITLE: Notes on the Fisher-Welch-Wald test

SOURCE: AN SSSR. Doklady*, v. 154, no. 3, 1964, 514-516

TOPIC TAGS: statistics, mathematical statistics, Fisher distribution, variance analysis, Fisher Welch Wald test, probability theory, testing statistical hypothesis

ABSTRACT: The Fisher-Welch-Wald test is used on the hypothesis H_0 of the equality of two average repeated samples $x_1, \ldots, x_n \in N(a_1, \sigma_1)$ i $y_1 \ldots, y_n \in N(a_2, \sigma_2)$. It is non-randomized and its critical area has the form

$$\frac{|\bar{x}-\bar{y}|}{\sqrt{s_1^2+s_2^2}} > \Phi\left(\frac{s_1}{s_2}\right), \qquad (1)$$

where $\bar{x}$, $\bar{y}$, s_1 and s_2 are the general notations of sufficient statis-

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tics for four parameters a_1, a_2, σ_1 and σ_2. All parameters in this case are unknown and in general $\sigma_1 \neq \sigma_2$ but the sample size was taken as equal. $\Phi(x)$ is the single-valued measurable Lebesque function with $x \geq 0$. A randomized test is shown. The well-known non-randomized Bartlett test (E. Lehmann, "Testing Statistical Hypotheses," Wiley, N. Y. 1959) for checking H_0 has the form

$$\frac{|\bar{x}-\bar{y}|}{\left(\sum_{i=1}^{n}[(x_i-\bar{x})^2+(y_i-\bar{y})^2]\right)^{1/2}} > C_0. \qquad (2)$$

It is similar with respect to σ_1 and σ_2 and is calculated with the help of Student's distribution. The indicated function of the critical area in test (2) is denoted by $\chi(x_1, \ldots, x_n; y_1, \ldots, y_n)$ and the projection of the χ function on the sufficient statistics space is then examined

$$\psi(\bar{x}, \bar{y}, s_1, s_2) = E(\chi \mid \bar{x}, \bar{y}, s_1, s_2). \qquad (5)$$

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